SCIENCE.

FRIDAY, MAY 1, 1885.

THE APRIL MEETING OF THE NATIONAL ACADEMY OF SCIENCES.

THE spring meeting of the national academy always secures a larger attendance of members than that held in the autumn, because the business of this stated session, including the election of new members, is more important. Last week, however, the attendance was not so good as usual, only thirty-seven members being registered. Of these, seventeen were from Washington, and the remainder principally from Philadelphia, Baltimore, New Haven, and Cambridge. Though lacking in special incident, the meeting was an interesting one; both scientific and business sessions extending over four days, and the papers eliciting a good share of discussion. Public and private receptions were not wanting, and the mid-day recess gave excellent opportunities for social intercourse. Though many questions affecting the policy and the development of the academy were discussed with great freedom at the business-meeting, these discussions were not marred by a single note of discord.

The trust funds of the academy having been increased during the year by the gift of eight thousand dollars from the widow of the late Professor Lawrence Smith, and in his memory, to encourage the study of meteoric bodies, Messrs. Wolcott Gibbs, Brush, Asaph Hall, Pumpelly, and Rutherford were appointed a permanent committee to administer the trust; and they were also charged with the duty of conveying to Mrs. Smith the thanks of the academy, and its appreciation of her generosity. The award of the Draper medal, made for the first time, was most appropriately bestowed on Prof. S. P. Langley of Allegheny, now absent in England, for his researches and discoveries in solar radiation.

The academy was strengthened by the election of five new members: Prof. E. S. Holden, director of Washburne observatory, Madison, Wis., the chief of the recent Caroline Island eclipse expedition; Professor Henry Mitchell of the U. S. coast-survey, whose knowledge of the hydrography of our eastern coast is unsurpassed; Mr. F. W. Putnam, the curator of the Peabody museum of American archaeology at Cambridge; Prof. W. A. Rogers of the Harvard observatory; and Mr. Arnold Hague of the U. S. geological survey, whose work has lain chiefly in our western territories. As the number of home members is now ninety-eight, it is probable that by another year it will reach a hundred, beyond which it will be difficult to pass, on account of the more stringent rules of admission which will then come into force.

We have only space to mention a portion of the papers, a complete list of which will be found in our notes. Jupiter was the subject of two astronomical papers. Prof. C. A. Young called attention to some changes in the constitution of the 'great red spot,' and to the belt of white spots in the southern hemisphere. The period of one of the latter, the upper of a lozenge-shaped series of four, he had found to be 9 h. 55 m. 12.74 s., and that of an equatorial white spot 9 h. 50 m. 9–12 s., while that of the great red spot was now 9 h. 55 m. 13.4 s. Mr. G. W. Hill discussed the two inequalities in the moon's motion due to the action of Jupiter, the theoretical discovery of which is due to Mr. Neison, finding the coefficients for these inequalities smaller than given by Neison; the former's values being $-1.163''$ and $+2.200''$, while Mr. Hill obtained $-0.903''$ and $+0.209''$. In a paper on the cause of the progressive movement of areas of low pressure, Prof. E. Loomis concluded, that, although in middle latitudes these areas usually follow the course of the winds, the general drift of atmospheric movement could not be looked upon as the cause. Their

progress could be compared to that of a great atmospheric wave, the pressure being more steady and persistent on the one side (in this case the west) than on the other. Prof. H. A. Rowland exhibited a tabular view of the different values which had been given to the ohm, and criticised that which had received the sanction of the Paris electrical conference as an average derived by giving equal weight to values obtained by admittedly unequal methods. By adding to the table of the Paris conference the results reached by the American committee in its investigations, and allowing each result its proper proportional value, he had obtained a column of mercury of one square millimetre section and 106.2 centimetres high as a satisfactory average, which the American committee therefore recommends.

Perhaps the greatest public interest attached to the two papers of Dr. Graham Bell, given on the last day of the session, one on the possibility, while at sea in a fog, of detecting by means of echoes the proximity of dangerous objects. Mr. Della Torre and Mr. Bell had experimented by means of a gun and a receiving-trumpet, and had obtained echoes from passing vessels at a distance of from a quarter of a mile to a mile, according to their size. The other showed the results of some experiments he had made on the audition of school-children of Washington. He exhibited an audiometer he had devised, in which two flat coils of insulated wire were so adjusted as to admit of separation on a graduated scale measuring the distance between their centres. An electrical current, produced by the rotation of a Siemens armature between the poles of a permanent magnet, is passed through one of the coils, and is rapidly interrupted by the rotation of a disk, a telephone being attached to the other. The intensity of the sound produced being dependent upon the intensity of the current induced in the coil to which the telephone is attached, and this upon the distance between the coils, a ready measurement of audition is obtained. The use of this instrument proved that ten per cent of the more than seven hundred pupils examined with the assistance of Mr. H. G. Rogers were hard of hearing (in their best ear), and seven per cent had very acute powers; the general range of audition being measured on the scale by the separation of the disks to a distance of from fifty to eighty centimetres, while the total range was from twenty to ninety centimetres. It is known, on the other hand, that in some institutions for the deaf as many as fifteen per cent are merely hard of hearing.

Dr. Ira Remsen brought to the notice of the academy a case in which chemical action was affected by magnetic influence. Placing a test-tube containing nitric acid in the middle of a coil through which a current was made to pass, he found that the action of the acid on a strip of iron placed in it was sensibly lessened, by at least ten per cent, when compared with that of another strip of iron placed in similar circumstances excepting for the absence of the electric current. Dr. Sterry Hunt proposed a classification of the natural silicates which make up a large part of our earth's crust, dividing them into three groups, according to their bases, and distinguishing them as protosilicates, persilicates, and protopersilicates. These divisions he believed were more natural than those which divided them according to their sensible qualities, or otherwise, and indicated genetic distinctions.

On the biological side, the papers, while perhaps not so attractive to the public as those already mentioned, were of more than usual philosophic interest. Prof. E. D. Cope, in a communication on the pretertiary vertebrates of Brazil, which were referred to the cretaceous, Jurassic, and upper paleozoic, and which contained many interesting types, pointed out also that a single pliocene fauna extended from south of our borders to Patagonia, and that neither eocene nor miocene beds had been discovered in South America. In a more elaborate paper on the phylogeny of the placental mammalia, based largely on discoveries in the western parts of North America, he claimed, that while many details remain to be worked out, and though their didelphian ancestors had

not yet been discovered, the phylogeny of the orders of placental mammals was now undoubtedly completed in its main features. The phylogeny of the clawed groups has been traced back to a common ordinal form, the Bunotheria, and that of the hoofed groups to the contemporaneous order, Condylarthra; while at the same time the characters of the feet of the Condylarthra agree with those of clawed placental mammalia, and bind the series together; the anthropoid line may also be traced directly through the lemurs to the Condylarthra. These views were fortified by numerous examples. Mr. S. H. Scudder gave a sketch of the geological development of the orders of winged insects, in which he claimed that no ordinal differentiation could be detected in paleozoic insects, although all the existing orders were fully developed by the middle of the mesozoic period: he therefore held that we were to look to the triassic period for the most interesting future discoveries in this field. Dr. T. Gill exposed his latest views regarding the orders of fishes, and introduced a speculative paper, by Dr. Ryder, on the flukes of whales, which he looked upon as the posteriorly transferred, hypertrophied, tegumentary elements of the mammalian hind-legs, basing his argument on embryological evidence, and on the anterior transference of the front limbs and girdle in certain mammalia. Dr. J. S. Billings exhibited a series of composite photographs of skulls, and explained the method pursued in taking them directly from the skull; as also a method of measuring the cubi capacity of crania, devised by Dr. Matthews. This consisted briefly in the rapid use of water instead of shot or seed, after rendering the skull water-tight by closing all the small openings with putty, spraying the interior with thin varnish, and embedding the whole skull in putty. Finally, Major Powell read a paper on the organization of the tribe, and the differentiation of kinship, distinguishing between agnatic kinship, founded upon brother groups, and enatic kinship, founded upon sister groups.

The next meeting of the academy will be held in Albany, beginning Nov. 10.

LETTERS TO THE EDITOR.

**** *Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

Mr. Hampden's designation of Sir Isaac Newton.

ON p. 283 of *Science* (April 3) it is stated that "to call Sir Isaac Newton 'a fanatical pantheist' is a happy thought which would certainly not have occurred to everybody." I trust I shall not incur the risk of identification with the disciples of Mr. John Hampden if I venture to express my conviction that this gentleman does not vituperate Newton when he applies to him a term at once appropriate and just. Surely, if such were my opinion, I should be justified in asserting that the *scholium generale* at the end of the third book of the 'Principia' reads like the drivel of a cretin rather than a scientific conclusion. While science itself forms a grand and sublime whole, — its only rival and superior being pure reason and sense, — it is nevertheless true that nothing can be more disappointing than many of the biographies of physicists, who, even in the most favorable instances, are but little great men. In Locke's correspondence with his nephew Sir Peter King, we perceive what a delicate matter it was to have any thing to do with Newton in connection with their precious mutual confidences with respect to the mystical and prophetical parts of the New Testament. Hitherto Sir Isaac's devotion — I may add, fanatical devotion — to theology has never been called in question. His laborious criticism of Dr. Burnett's 'Sacred theory of the earth' deserves a place among other kindred examples of human folly and irrational superstition, its object being to prove that the surface of the earth afforded indubitable evidences of the truth of the Bible account of creation.

M. C. O'BYRNE.

Highlands, Macon county, N.C., April 17.

A second phalanx in the third digit of a carinate-bird's wing.

There is not a single adult carinate-bird known bearing two phalanges at the third digit. Jeffries (*Proc. Bost. soc. nat. hist.*, xxi. 301–306) gives the following four families of birds having two phalanges in the first, three phalanges in the second, and one phalanx in the third digit: the Palamedeae, Anseres, Alectorides, and Pygopodes. The only living bird which has two phalanges in the third digit is the ostrich from Africa (Alix). According to Meckel (*Archiv. anat. phys.*, 1830, 233) and Nitsch (*Osteogr. beitr. natury. vögel*, Leipzig, 1811, 90), the ostrich possesses only one phalanx in the third digit. The only known bird having four phalanges in the third digit is Archaeopteryx (Dames) from the lithographic limestone.

It is evident that all birds at a former time had four phalanges in the third digit; and it seemed very probable to me that rudiments of at least one phalanx more than in the adult ought to be found in embryos of the above four families. This probability has been verified by the examination of an embryo of Anas domestica L. (length of ulna 2.5 mm.), where I find a rudiment of a second cartilaginous phalanx in the third digit.

I think it not improbable that the rudiment of a third phalanx (if there is really a second one in the third digit) will be found in embryos of the ostrich, which I hope soon to examine.

DR. G. BAUR.

Yale-college museum, New Haven, Conn., April 24.